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A MULTIVARIATE ANALYSIS OF THE SELECTION FACTORS OF CARBONATED SOFT DRINKS IN BANGLADESH

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Abstract

This paper aims at identifying the factors affecting the selection of soft drinks by the university students of Bangladesh. It only includes carbonated soft drinks consumers of Bangladesh. To identify the factors, a questionnaire survey was conducted among 200 soft drinkers. The respondents were selected by simple random procedure. Only the university students who are at the age of 20 to 35 years were surveyed. Multivariate analysis techniques such as factor analysis and multiple regressions analysis were conducted to analyze the data. Factor analysis was used to identify the factors of the soft drinks consumers while multiple regressions were conducted to identify the significant relationship of the factors with the overall attitude of the consumers towards soft drinks. Results show that the factors identified by factor analysis are together significantly related to the overall consumption attitude of the consumers. Removing tiredness, digestive, sweetness and coolness are the significant factors of the university students in selecting carbonated soft drinks in Bangladesh.

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1. Background

University students are the main users of the carbonated soft drinks in Bangladesh. However, the selection of the drinks by these users depends on a number of factors which are important to the distributors and sellers. To identify the factors that have influence on the selection process of carbonated soft drinks, a number of literatures on soft drinks were reviewed.

Fransi and Viadiu (2007) analyzed various elements that influence the purchasing behavior of online consumers of the products. They analyzed the expected and perceived data of a sample of Spanish online customers and found that a number of factors are responsible in purchasing decision of the consumers such as fulfillment of the promises, prompt attention to complaints, easy and effective navigation, suitable presentation of the product and its characteristics, projection of a good image in transactions, information regarding the purchase process, the availability of a product, purchase confirmation, confidentiality of the clients' data, website information, leisure elements, individualized attention, 24 hour telephone service, updated website and so on. Granger and Billson (1972) examined the changes in consumer preferences for different package sizes when price per unit information is explicitly provided. That means the price of the product is the indicator to the consumers to select the right product package. Price is very much important in Bangladesh where most of the people are under the poverty line. Brand image is a common factor for selecting soft drinks by the young consumers. Strong brand image propels consumers towards the buying of that product and ultimate consumption. Gibson (2008) explored the effects of evaluative conditioning on mature brands of the product and found that the old brand has got better image to the consumers than new brand. Alhabeeb (2007) identified the dynamic relationships between consumer trust and product loyalty. This study shows that the mature of brand is an indicator for selecting soft drinks. Organic food and its price are interlinked which are also factors for selecting soft drinks by the consumers. Men have different attitude than female in this regard. Urena et al (2008) identified that women have a more favorable attitude to the purchase and consumption of organic food than men, where as, men are inclined to pay a higher price for organic food. Age is factor for selecting the soft drinks by the consumers. Hence, Chambers et al (2008) explored potential variations in attitudes, motivation and behavior as a function of age and gender in selecting soft drinks.

Food safety is a factor for the selection of soft drinks by the consumers. If the brand of the drinks is safe, people will use it more than the unsafe ones. Odwin and Badrie (2008) determined perception and awareness of food safety practices of the consumers in Trinidad and Barbados. They identified many gaps in proper food safety practices in the homes. Meanwhile, Sehrawet and Kundu (2007) established the residential background of consumers has a varying influence on their buying decisions. Hossain et al (2008) has assessed consumer perceptions and attitudes towards contaminated food items and found that the consumers are skeptical to select such food and drinks.

There is a portion of the soft drinks markets that prefers stimulant drinks. They are mainly among the young consumers. Sorenson and Bogue (2006) identified new market segments for stimulant beverages beyond the consumer groups who are traditionally targeted with stimulant drinks. Majumdar (2007) examined market characteristics and identified critical success factors such as brand strength, distribution network, efficient bottling, advertising, positioning and visibility at retail locations of the drinks and found these factors important in selecting soft drinks. Khalili et al (1998) reviewed the marketing strategy of soft drinks, demand for various brands, quality control etc. and found them very important factors for selling the soft drinks. Marketing mix policies is an important factor for selling the soft drinks in Bangladesh (Solaiman and Chowdhury 1996; Nuruzzaman 1996). Hossain and Bhayani (2005) explored some attributes such as taste, flavor, digestive, price, color, calorie content, sugar content, pungent, hygienic, brand image, power of freshness, good for health, light, mental satisfaction, good container, sweetness, lemon, soft, good packaging, caffeine, and increase status of soft drink which have strong influence on consumer brand preference in Bangladesh especially among the young soft drinks consumers.

2. Overview of Soft Drinks Business in Bangladesh

The origin of soft drinks, also known as non-alcoholic beverages, is linked with Sherbet developed by the Arabs. However, there are different types of sherbets available now a day, such as, juice, mineral water, and carbonated soft drinks in Bangladesh. In a broader sense, soft drinks include colas, sparkling water, iced tea, lemonade, squash and fruit punch. Carbonated soft drinks are also known as soda, pop or soda pop, fizzy drinks or sometimes just coke in some places of this world. In the West, non-carbonated soft drinks date back to the 17th century and that of carbonated drinks to the 18th century, while marketing in bottles started in the 19th century. From the early 20th century, sale of carbonated drinks increased dramatically and by the middle of the same century brands like Coca Cola became the icon of the industry in throughout world. Today, soft drinks both carbonated and non-carbonated have spread over in a variety of forms and brands all over the world. However, in terms of carbonated drinks, Coca Cola and Pepsi are the leading brands in most parts of the world including Bangladesh.

Coca Cola was the first carbonated soft drink introduced in the then undivided Pakistan in 1962. After 1971, the Coca Cola production unit in Bangladesh was given to the Freedom Fighter Welfare Trust. Initially, the production capacity was 65 bottles per minutes (bpm) before the handover. The capacity was dropped to 45 bpm later on. However, with new machinery installed, the capacity was increased to 250 bpm in 1985. In 1990, another plant with 500 bpm production capacity was added to this unit. The marketing territory of Coca-Cola Export Corporation whose brands are Coca Cola, Sprite and Fanta was divided into 2 segments. Tabani Beverage got the marketing territory of Dhaka, Rajshahi and Khulna divisions and part of Barishal division while Abdul Monem Limited got the marketing territory of Chittagong and Sylhet divisions and a part of Barishal division. However, the Coca Cola producing factories, especially the ones under Tabani Beverage, began to be under pressure by worker disputes, management inefficiency, political interference and such other problems that lead to the decrease in the supply of Coca Cola in the market. In 2002, Coca-Cola's Bangladesh director had to flee Bangladesh after getting repeated extortion and death threats from a notorious under world terrorist. Recently, production of Tabani Beverage Company has been completely shut down (The Executive Times,

2008). The soft drinks market in Bangladesh is more than a Tk. 8000 million (US \$114.28 million; 1 US dollar is equivalent to Tk. 70.00) market, which is expected to reach Tk.10,000 million (US \$142.86 million) soon, and company insiders believe that there is a huge prospect of this product for the market to expand. The details of the companies and their products in Bangladesh are shown in Table 1.

Table 1 Companies Producing Soft Drinks in Bangladesh

Variables	Name of Soft Drinks Producing Companies					
	Globe Soft Drinks Ltd.	Akij Food and Beverages Ltd	Pran RFL Group	Globe Beverage Company Limited	Transcom Beverages Ltd	Partex Beverages Limited
Year of Soft Drinks Launch	2002	2006	2006	2005	2000	1997
Brands in the Market	URO-Lemon, URO-Cola, URO-Orange, Lychena, FizzUp, Royal Tiger Energy Drinks, Alma Mineral Water	Mojo , Lemu, Clemon, Speed (Energy Drink), Spa	Pran Up, Pran Cola, MAXX Cola	Virgin, Zam Zam Cola	Persi, 7up, Mirinda, Mountain Dew, Slice	RC(Royal Crown) Cola, Upper 10, Big Boss, RC Q Lemon, Mum
Production Capacity	50,000 litre per hour	N/A	N/A	N/A	N/A	N/A
Factory Location	Noakhali and Kachpur, Dhaka	Dhamrai, Dhaka	Narshingdi	Gazipur	Konabari, Gazipur and Kalurghat, Chittagong	Jangaliapara, Banglabazar, Joydebpur, Gazipur
Total Investment	N/A	400 Crore Taka	N/A	50 Crore Taka	N/A	N/A
Workforce	N/A	N/A	N/A	120	2000	250

Source: The Executive Times, September 2008, pp.29-32.

If we look at the market share of the soft drinks in Bangladesh, it will be clear to us that Pepsi has now positioned itself as the top brand . According to a survey carried out in 2007, Coke's market share in Bangladesh is about 22 %, Pepsi 27% and RC's 16%. The survey also reveals 50% of the market is occupied by international brands while the rest of 50% by local brands. With vigorous marketing campaign undertaken by Partex Beverages Ltd, Royal Crown (RC) is poised to increase its market share. Compared to these three international brands, Virgin put up a weak performance as it was re-launched in 2005 by Global Beverages Ltd. It is expected that the Virgin brand will eventually do well. In terms of juices, Pran has already earned a good reputation but its cola drink has yet to make its position. Pran's soft drinks occupy 8% of the

market share. Mojo is another brand coming up and expanding in a rapid rate as it is the symbol of the young people and the bottle size is appropriate to the customers (Table 2).

Table 2 Market Share of the Soft Drinks in Bangladesh

Brand	Market Share (Percentage), 2007
Pepsi	27
Coke	22
Royal Crown(RC)	16
Uro	12
Mojo	08
Pran	08
Others	07

Source: The Executive Times, September 2008, p.21

This analysis indicates that the local brand is growing rapidly in Bangladesh and international brands are going down. The reasons might be attributed by the awareness of the customers of Bangladesh.

3. Research Methods

This study was conducted among the carbonated¹ soft drinks consumers who are at the age of 25-35 years and the students of leading private universities in Bangladesh (See Table 3). This is an exploratory type of research. Two hundred samples were interviewed to identify the factors related to selection of soft drinks by the young users. To collect data, the sample respondents were selected on a random basis. A structured questionnaire was used to identify the selection factors of the soft drinks users. The variables used in the questionnaire include taste, flavor, price, quality, refreshment, cool, brand image, packaging, advertisement, sweetness, remove tiredness, digestive and color etc. To make the study representative, the sample respondents were selected from the leading private universities of Bangladesh. The sample distributions are shown in Table 3.

¹ Carbonation occurs when carbon dioxide is dissolved in water or an aqueous solution (Wikipedia, 2008).

Table 3 Sample Distribution of the Young Soft Drinks Consumers in Bangladesh

Sl. No.	Name of the University	Number of Respondents	Percentage (%)
1	East West University	60	30.00
2	North South University	45	22.50
3	American International University of Bangladesh	40	20.00
4	BRAC University	35	17.50
5	Independent University Bangladesh	20	10.00
	Total	200	100

Table 3 shows that 30% of the respondents were selected from the East West University followed by North South University (22.50%), American International University of Bangladesh (20%), BRAC University (17.50%), and Independent University Bangladesh (10%). The selection of the students was made on a simple random sampling procedure. They were selected by N_{Cn} ways.

In analyzing data, both descriptive and inferential statistics were used. Multivariate analysis technique such as factor analysis was used to identify the factors related to the selection of soft drinks by the university students of Bangladesh. Multiple regressions were conducted to identify the relationship between the overall consumption decision and the selecting factors of the soft drinks. The overall selection attitudes are personal and socioeconomic factors of the families of the drinker students.

4. Results and Discussions

This study primarily used two important analyses such as factor analysis and multiple regression analysis. Following sections deal with the results of the analysis of data.

4.1 Results of the Factor Analysis

The variables used in the factor analysis are highly interrelated to each other. The communalities of the variables are also very high. High scores of communalities indicate that the variables have very high inter-relationship among them (Table 4).

Table 4 Communalities of the Variables Used in Selecting Soft Drinks by the University Students of Bangladesh

Variable	Scores
Taste	.614
Flavor	.715
Price	.489
Quality	.339
Refreshment	.672
Cool	.687
Brand image	.738
Packaging	.419
Advertisement	.679

Sweetness	.701
Remove tiredness	.660
Digestive	.546
Color	.745

Extraction Method: Principal Component Analysis.

Results also show that the factor analysis identified 6 important factors from 13 variables concerned with soft drinks consumers' selection preferences. The factors are color and price (1.68), brand image and refreshment (1.48), removing tiredness and digestive (1.41), advertisement (1.28), flavor and taste (1.10), sweetness and coolness (1.03) (Table 5).

Table 5 Factors Affecting the Selection of Soft Drinks by the University Students of Bangladesh

Factors	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
Color and price	1.684	12.955	12.955
Brand image and refreshment	1.488	11.449	24.404
Removing tiredness and digestive	1.412	10.859	35.264
Advertisement	1.283	9.867	45.130
Flavor and taste	1.101	8.473	53.603
Sweetness and coolness	1.037	7.975	61.579

Extraction Method: Principal Component Analysis.

The most important selection factor of the soft drinkers is color and price with the highest eigenvalue and the variance (12.95%). This indicates that the young soft drinks consumers in Bangladesh give highest importance on the color and the price of the product. The second important factor is brand image and refreshment (11.44%) followed by removing tiredness and digestive (10.85%), advertisement (9.86%), flavor and taste (8.473%), sweetness and coolness (7.97%)

Table 6 shows that the most important factor for selecting the carbonated soft drinks such as color and price are constituted with three variables. The variables are color of the drinks, the price and of the drinks quality. The factor loadings of that variable are 0.763, 0.674 and -.452 respectively. The second important factor is brand image and refreshment which is constituted with brand image (0.820) and refresh ness of the drinks (0.764). Removing tiredness and digestive factor is formed with two variables with the factor loadings of -.796 and 0.583 respectively. Advertisement and packaging formed the factor advertisement with factor loadings of 0.767 and 0.583. Sweetness and coolness is formed with two variables such as sweetness of the drinks (0.80) and the coolness of the drinks (0.670).

Table 6 Factors Loading of the Soft Drinks Selection Factors

Factors	Variables	F1	F2	F3	F4	F5	F6
Color and price	Color	.763					
	Price	.674					
	Quality	-.452					
Brand image and refreshment	Brand image		.820				
	Refreshment		.764				
Removing tiredness and digestive	Removing Tiredness			-.796			
	Digestive			.583			
Advertisement	Advertisement				.767		
	Packaging				.583		
Flavor and taste	Flavor					.744	
	Taste					-.651	
Sweetness and coolness	Sweetness						.800
	Coolness						.670

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. a Rotation converged in 9 iterations.

4.2 Results of Multiple Regressions Analysis

Results of multiple regressions analysis show that the correlation (R value) is 25.50% while the R square value is 6.50% (Table 7). This indicates that the factors constituted with the 13 variables in selecting soft drinks consumers' explain only 6.50% of the total reasons for preference of soft drinks. The other factors might be related to the personal and socioeconomic status of the soft drinkers' families. As the samples were derived from the university students, the socioeconomic status means the financial status of the parents or guardians of the students and their family beliefs regarding the soft drinks.

Table 7 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.255(a)	.065	.036	1.393

a Predictors: (Constant), REGR factor score 6 for analysis 1, REGR factor score 5 for analysis 1, REGR factor score 4 for analysis 1, REGR factor score 3 for analysis 1, REGR factor score 2 for analysis 1, REGR factor score 1 for analysis 1

The overall results show that the factors identified by the factor analysis are as a whole significantly related to the overall purchasing decision towards soft drinks (Table 8). This indicates that the factors identified by this analysis are together significantly related to the overall decision of the young soft drinkers of Bangladesh.

Table 8 ANOVA^(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	26.078	6	4.346	2.241	.041(a)
	Residual	374.277	193	1.939		
	Total	400.355	199			

a Predictors: (Constant), REGR factor score 6 for analysis 1 , REGR factor score 5 for analysis 1 , REGR factor score 4 for analysis 1 , REGR factor score 3 for analysis 1 , REGR factor score 2 for analysis 1 , REGR factor score 1 for analysis 1

b Dependent Variable: overalls

Individual factor test show that only two factors are individually significantly relationship to the overall decision of the consumer toward of the soft drinks buyers (Table 9). Removing tiredness and digestive factors are significantly related to the overall decision of the soft drinks customers at the 5% level of significance. This indicates the better the digestive of the drinks in nature the higher the demand will likely be . As this study is a new study, it accepts the factor called sweetness and coolness of the soft drinks with the significance level of 10%. This indicates that the young drinkers prefer cool and sweet drink all the time.

Table 9 Coefficients^(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.635	.098		26.759	.000
	Color and price	-.062	.099	-.044	-.625	.532
	Brand image and refreshment	.099	.099	.070	1.001	.318
	<i>Removing tiredness and digestive</i>	-.255	.099	-.180	-2.583	.011
	Advertisement	-.096	.099	-.068	-.970	.333
	Flavor and taste	.123	.099	.086	1.242	.216
	<i>Sweetness and coolness</i>	-.168	.099	-.119	-1.703	.090

a Dependent Variable: overalls

5. Conclusions and Recommendations

There are six important factors to select the carbonated soft drinks in Bangladeshi consumers. The factors are color and price, brand image and refreshment, removing tiredness and digestive, advertisement, flavor and taste, sweetness and coolness. The most important factor of the soft drinks selecting by young users is color and price indicating that the young soft drinkers in

Bangladesh give highest importance on these factors in selecting soft drinks followed by brand image and refreshment, removing tiredness and digestive, advertisement, flavor and taste, sweetness and coolness. These factors are together significant to select the soft drinks by the university students of Bangladesh. However, the factors identified by this study are important for the selection decision of the young soft drinkers. Other factors related to the individual and socioeconomic status of his/her family such as, family consumption habit of the soft drinks, economic status of the family, family orientation culture and belief regarding soft drink, the degree of religious practices in the family etc.

This research identified that the university students select carbonated soft drinks primarily based on two factors such as removing tiredness and digestive and sweetness and coolness. In Bangladesh, soft drinks are selected by the university students to remove their tiredness. It is popularly perceived in Bangladesh that the soft drinks can relieve the tiredness and tension of the people. It is also perceived by the young soft drinkers that the soft drinks are useful for digestion. Sometimes, elders also suggest that carbonated soft drinks for better digestion. Therefore, the better the digestive of the drinks in nature the higher the demand will likely be by the young soft drinkers. Another significant factor for selecting the carbonated soft drinks by the university students is sweetness and coolness. Usually, soft drinks are sold when it is cool. All shopkeepers keep it in their refrigerators to make it cooler. Because of sweet flavor soft drinks are often consumed by the university students in Bangladesh.

It is already mentioned that six factors are used by the university students in selecting their soft drinks in Bangladesh. However, there is an ample scope to conduct study on this area and identify the factors related to the person who drinks, and socioeconomic status of the drinkers and their families as well.

References

1. Alhabeeb, M.J. (2007), "On Consumer Trust and Product Loyalty", *International Journal of Consumer Studies*, Vol.31.
2. Cavallo, J. (2000), "The Challenge of Managing Taste", *Beverage Industry*, Vol. 91.
3. Chambers, Stephanie, Lobb, Alexandra, Butler, Laurie and Traill, W. Bruce (2008), "The Influence of Age and Gender on Food Choice: A Focus Group Exploration", *International Journal of Consumer Studies*, Vol.32.
4. Cosgrove, J. (2004), "Can Fortified Beverages Taste Great and be Good for You?", *Beverage Industry*, Vol. 95.
5. Datamonitor (2004), *Soft Drinks Industry Profile: Global*, Datamonitor, London.
6. Foote, A. (2002), "What's New? Global Beverage Flavor Trends", *Beverage World International*, Vol.20.
7. Frans, Eduard Cristobal and Viadiu, Frederic Marimon (2007), "A Study of E-Retailing Management: Analyzing The Expectations and Perceptions of Spanish Consumers", *International Journal of Consumer Studies*, Vol.31.
8. Gibson, Bryan (2008), "Can Evaluative Conditioning Change Attitudes Toward Mature Brands? New Evidence from the Implicit Association Test", *Journal of Consumer Research*, Vol.35.

9. Granger, C. W.J. and Billon, A(1972), “ Consumers’ Attitudes Toward Package Size and Price”, *Journal of Marketing Research*, Vol.9(3).
10. Hossain, Md. Motaher, Heinonen, Visa and Islam, K.M. Zahidul (2008), “Consumption of Foods and Foodstuffs Processed with Hazardous Chemicals: A Case Study of Bangladesh”, *International Journal of Consumer Studies*, Vol.32.
11. Hossain, Md. Enayet and Bhayani, Sanjay (2005), “Consumer Attitudes Towards the Soft Drink (SD) in Bangladesh: A Look at the Impact of Brand and Attributes”, *Management Trends*, Vol.2(1), Saurashtra University, Gujrat.
12. ING Barings (2001), “The Global Soft Drinks Market”, *Beverage World International*, Vol.19.
13. Khalili, Masumur Rahman, Billah Masum and Islam, S.M. Milon (1998), “Beverage: A Potential Industrial Sector”, *Monthly Panorama*, Vol. 10.
14. Majumdar, Ramanuj (2007), *Product Management in India*, Prentice Hall of India Private Limited, New Delhi.
15. Mintel (2004), *Carbonated Soft Drinks-Ireland*, Mintel International, London.
16. Nuruzzaman, Md. (1996), “Marketing of Soft Drinks in Bangladesh: A Case Study on Bangladesh Beverage Industries Ltd. Dhaka”, *Business Review*, Vol.2 (1), Khulna University, Khulna.
17. Odwin, Ranate and Badrie, Neela (2008), “Consumers’ Perceptions and Awareness of Food Safety Practices in Barbados and Trinidad, West Indies-A Pilot Study”, *International Journal of Consumer Studies*, Vol.32.
18. Solaiman, Md. And Chowdhury, Md. Tayub (1996), “Marketing of Soft Drinks in Bangladesh: A Case Study of Eastern Beverage Industry Ltd. in Chittagong”, *Journal of Marketing Studies*, Vol.1 (1), Chittagong University, Chittagong.
19. Sorenson, Douglas and Bogue, Joe (2006), “Modeling Soft Drink Purchasers’ Preferences for Stimulant Beverages”, *International Journal of Food Science and Technology*, Vol.41.
20. Sehwat, Mahavir and Kundu, Subhash C. (2007), “Buying Behavior of Rural and Urban Consumers in India: The Impact of Packaging”, *International Journal of Consumer Studies*, Vol.31.
21. The Executive Times, Bangladesh, September 2008, p.21
22. Urena, Felix, Bernabeu, Rodolfo and Olmeda (2008), “Women, Men and Organic Food: Differences in Their Attitudes and Willingness to Pay: A Spanish Case Study”, *International Journal of Consumer Studies*, Vol.32.
23. Wikipedia (2008), *Carbonation*, Available at: <http://en.wikipedia.org/wiki/Carbonated> (Accessed on 1st July, 2008).